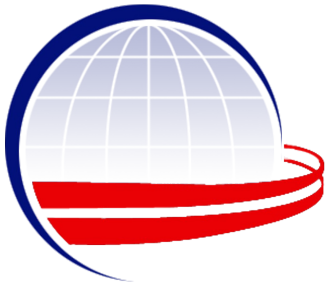
Implementing HF
Gwen Miller/Andrew Mansfield
18 February 2004



HORIZONTAL FUSION

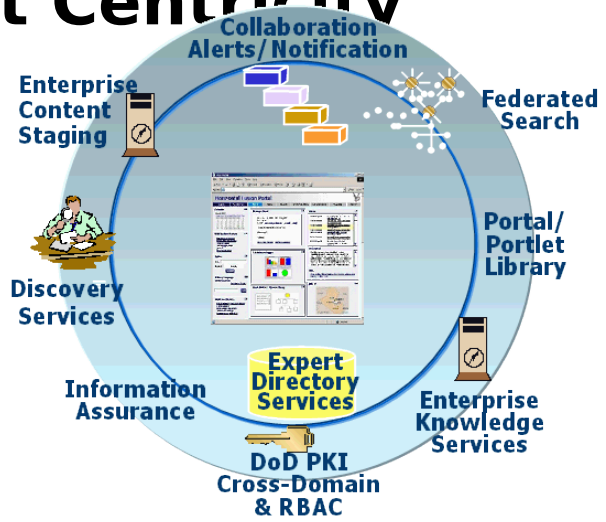
CATALYST FOR NET-CENTRIC TRANSFORMATION • DEPARTMENT OF DEFENSE

What does HF provide the Warfighter?

- **Places operators and analysts in the same virtual space enabling a seamless collaborative development and execution of operations**
- **Single access point enhances situational awareness and reduces the burden on mission planners**
- **Shortened decision cycles and force efficiency**

Collateral Space Overview

Collateral Space is the collection of enterprise services that provide the infrastructure required for Horizontal Fusion's Net Centricity



"Providing improved and increased visibility and access to intelligence and operations information through a standards-based interoperability framework."

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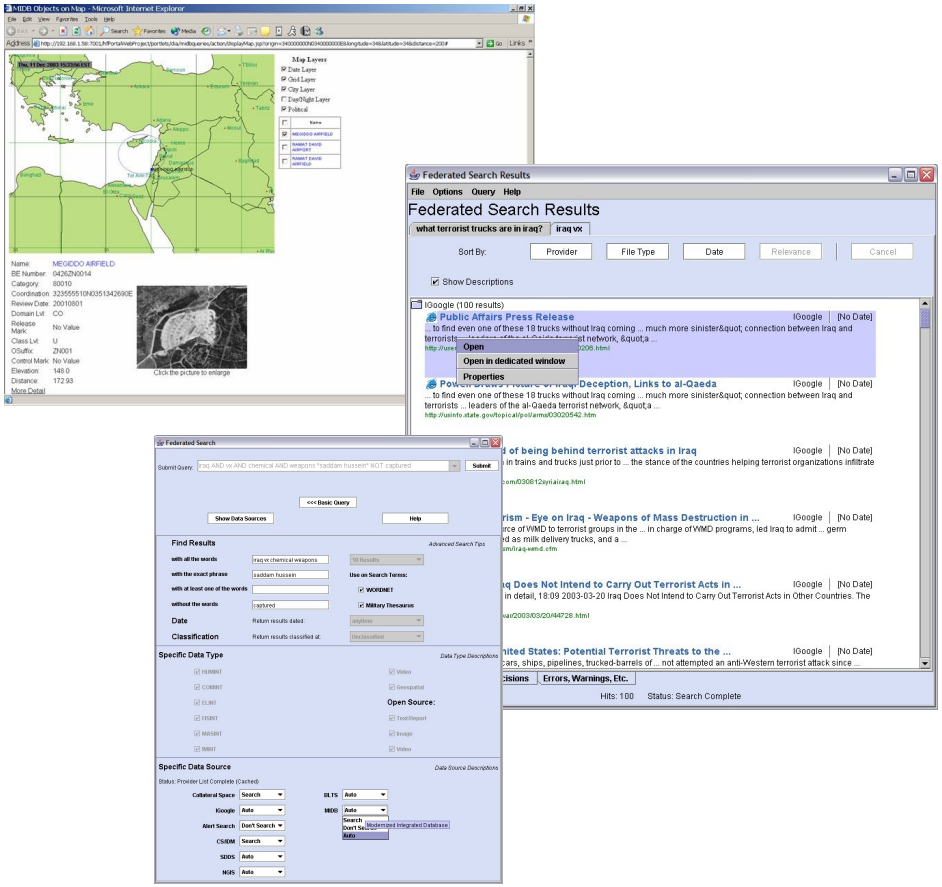
Mars Portal

- **A user entry point into the Collateral Space**
- **Portfolio members will have a direct and/or indirect interaction with the Portal**
  - **Direct interaction means a user can directly leverage Portfolio members' web-enabled data and/or service's from the Portal**
    - **Requires a portlet be developed by the Portfolio member**
  - **Indirect interaction means that your data and/or services are leveraged through the core enterprise services**
    - **i.e. implementation of the Content Discovery specification**
- **How data and services are represented is user defined (can come in multiple flavors)**
  - **i.e. thick client COP and OS WebCOP see the same data**



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Standards

- **Data Standards**
  - **Ontology's/Taxonomies**
  - **Data Specifications (Track, Person, Geo-spatial) will lead to the metadata tagging standards/schemas to be followed**
    - **i.e. security elements**
  - **DoD XML Registry**
- **Technology Standards**
  - **Implemented commercial technology standards (i.e. JSR-168 Portlet standard, HTML, XML, XACML, SAML, SOAP)**
- **Thin Client Standards**
  - **Netscape, Microsoft Internet Explorer**
- **Service Standards**
  - **Specifications for the Horizontal Fusion Services**
    - **Core Enterprise**
    - **Initiative provided**

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Data Standards

- **Established Data Management Focus Groups**
  - **DoD Discovery Metadata Specification (DDMS) - Alpha release 6 Jan 2004**
    - **Data/text**
    - **Intelligence Community Metadata Language – IC Security Model**
      - Security Tagging Standards
  - **Track Data Services**
    - **Track, Measurement, Coalition Intelligence, Surveillance and Reconnaissance (ISR), Electronic Intelligence (ELINT), Ground Moving Target Indicator (GMTI)/Track, Threat C2 Network – Final 1 Mar 2004**
  - **Ontology**
    - **NII/DISA Taxonomy Focus Group – Draft 24 Feb 2004**
    - **HF Reference Ontology – Final 12 Apr 2004**
  - **Geo-Spatial**
    - **Imagery, Geo Intelligence, Geo-Spatial**
      - Leveraging existing standards from OGC, ISO 19115, ebXML
  - **Person Specifications**
    - **Person, Relationship – Final 22 Mar 2004**
  - **Others**
    - **General Military Intelligence (GMI)/Modernized Integrated Data Base (MIDB) – Final 9 Feb 2004**
    - **Environmental – Final 30 Apr 2004**

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Standard Specifications

User/Admin Interfaces

- **Cross-platform/browser (HTML 3.2/4.0; DHTML; CSS 1.0)**
- **JSR 168 Portlet/JSR 170 Specification**
- **JDK 1.4.2**
- ***Limited* JavaScript**
- **Web Services for Remote Portal (WSRP)**
- **Accepts XML/XSLT**
  - **Automatic rendering in portlet**
- **SAML/XML Signature/Encryption**
- **PKI and Directory Services**
- **Syndication (RSS v1.0)**

- **DDMS and IC Metadata Framework**

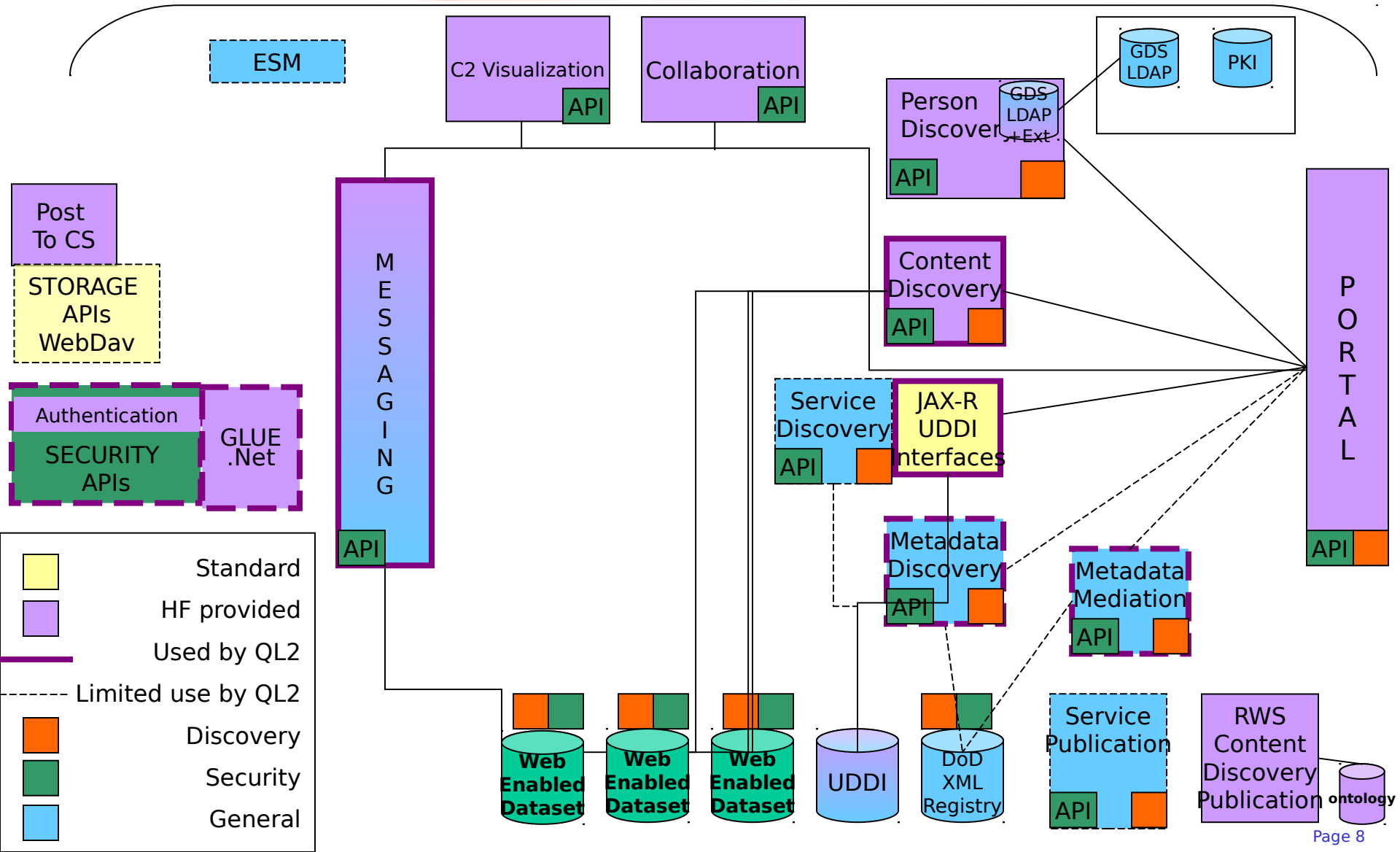
Middleware and Data Layers

- **XML & XML Schema v1.0**
- **Semantic Web Markup Languages (DAML, OWL)**
- **Registry standards (RDF/UDDI v2, JAXR)**
- **Web Services (WSDL v1.1, SOAP v 1.1), and JSR170**
- **J2EE (EJB, JAX Pack, JNDI, JMS)**
- **ODBC/JDBC**
- **SAML, XACML**
- **SQL database engines**
- **Syndication (RSS v1.0)**
- **XMPP**
- **JDK 1.4.2**
- **DDMS and IC Metadata Framework**
  - **Domain Namespaces**
  - **Content tagging**
  - **Taxonomies (categories)**
  - **Ontologies (relationships)**

xisting or Emerging W3C/Market Standards Gaining Mainstream Adoptio

-- Drives Cross-Platform Knowledge Interoperability --

Overall Enterprise Architecture



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Security: What are the Security Services?

- **Description:**
  - **Security Services provide authentication/validation services**
  - **Security Services provide Role Based Access Control (RBAC) to Service Oriented Architectures (SOA)**
  - **Security Services will help ensure that only users authorized to invoke Web Services can retrieve data from them**
  - **Security Services will ensure that the authenticity of messages to/from Web Services can be verified**

- **Schedule:**
  - **09 Feb 2004: WSDL finalized**
  - **31 Mar 2004: Reference Implementation and SDK available**

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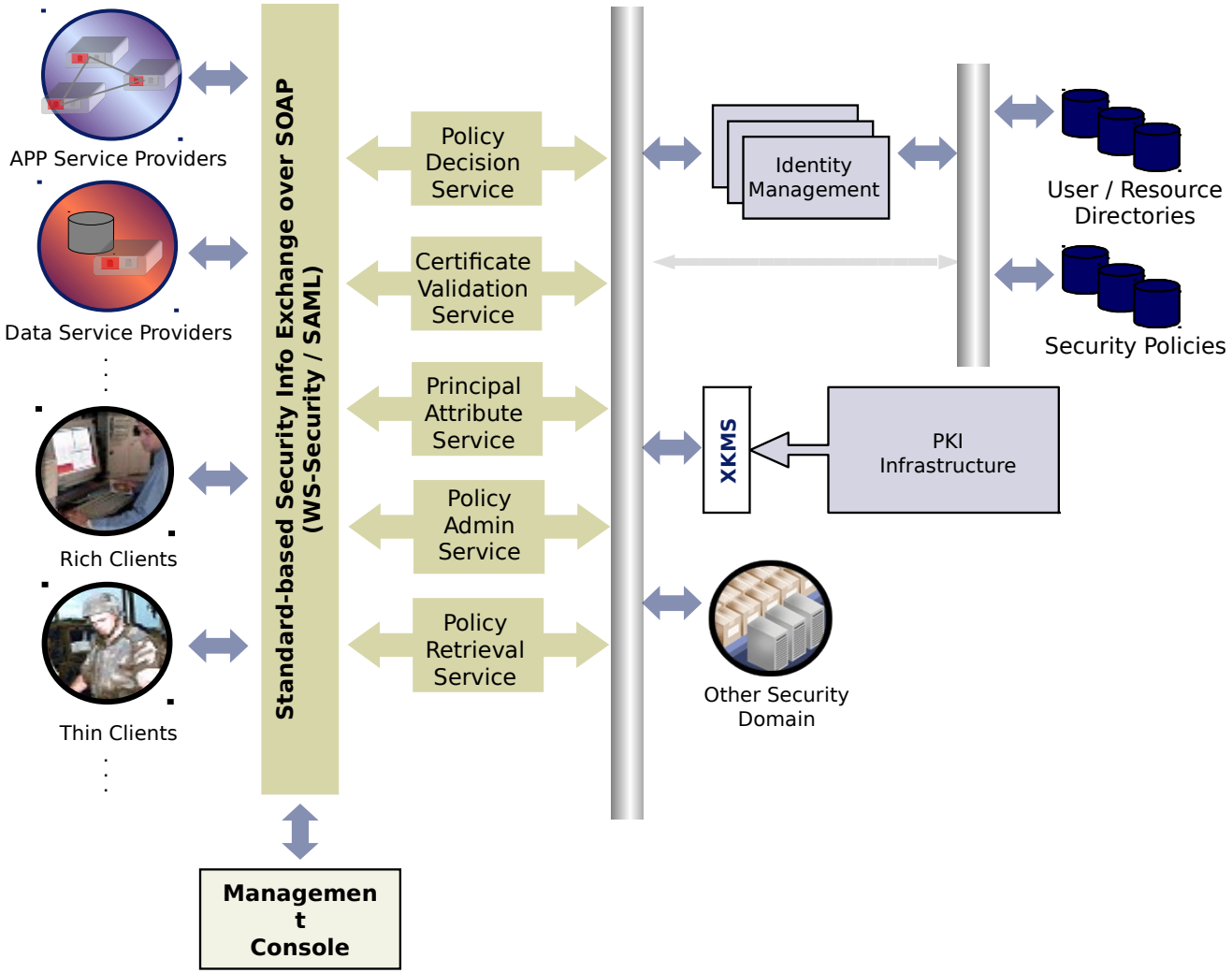
Security

- **Major Components:**
  - **Certificate Validation Service** – Allows the validity of a principal's credentials (PKI certificates) to be verified. This service is used by the Security Handler to ensure that a given set of credentials has not been revoked and is still valid
  - **Policy Retrieval Service** – Allows Access Control Lists (ACLs) to be retrieved
  - **Policy Administration Service** – Allows Access Control Lists (ACLs) to be Created, Updated and Deleted. This service provides a central mechanism for the storage of ACLs for Web Services and for other managed resources and data
  - **Principal Attribute Service** – A *principal* is a person, object, device, server or other entity that consumes a Resource. The Principal Attribute Service allows consumers to retrieve attributes about principals within the system
  - **Policy Decision Service** – This service allows consumers to authorize principals that are attempting to access resources within the system. Both the validity of the principal's credentials and the validity of the message are checked. The Policy Management Service may be called in order to check the ACL for the given resource, and the Key Management Service may be called to ensure the validity of the message communication

Security: Architecture



Service Discovery

- **Description:**
  - **Universal Description, Discovery, and Integration (UDDI) 2.0 standard SOAP/XML messages**
    - **Supports UDDI for any SOAP-capable client through a web service call**
    - **Java Users**
      - Java XML API for Registries (JAXR) 1.0
    - **Other development environments**
      - .NET has a SOAP toolkit, and there's numerous other SOAP enablers
      - V0.3 NCES Service Discovery Specification dated Feb 15, 2004
- **Schedule:**
  - **01 Apr 2004: Enterprise Service Discovery Taxonomy available**

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Content Discovery

- **Description:**
  - **Users access data sources in the Collateral Space**
    - **Execute smart search on disparate data repositories utilizing Military Language Understanding**
  - **Single point of registration for data providers**
- **Schedule:**
  - **18 Feb 2004:**
    - **Release final Search Web Service (SWS) version 1.0 specification**
    - **Release Registration Web Service (RWS) 1.0 (*draft*)**
  - **08 Mar 2004:**
    - **Final RWS Specification released**
  - **TBD:**
    - ***Draft* "How to" implement document**
      - Cover SWS and RWS

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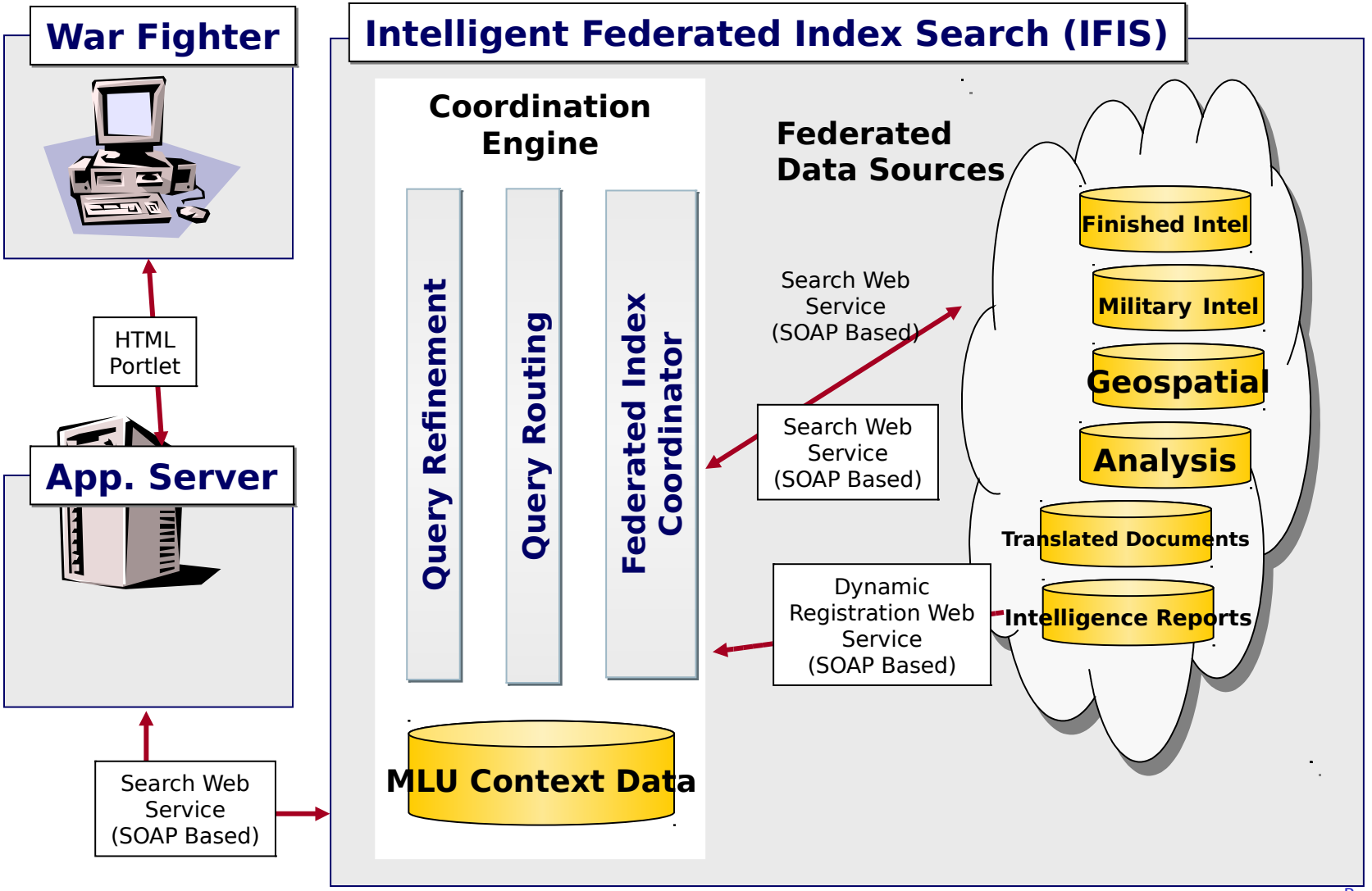
Content Discovery: Goal

- **Provide a means for the vastly different indexed data sources available on the SIPRNet to become an integrated searchable repository**
- **Route queries to the most appropriate set of registered data sources**
- **Design and implement a net-centric information querying system that understands the military's use of short-hand expressions, representations, and acronyms**
- **Use query refinement techniques to provide better query results**
- **Easy integration of partners into framework**
- **Use DoD Discovery Metadata Specification (DDMS) as core language of Search Web Service (SWS)**

Content Discovery: Federated Search Overview



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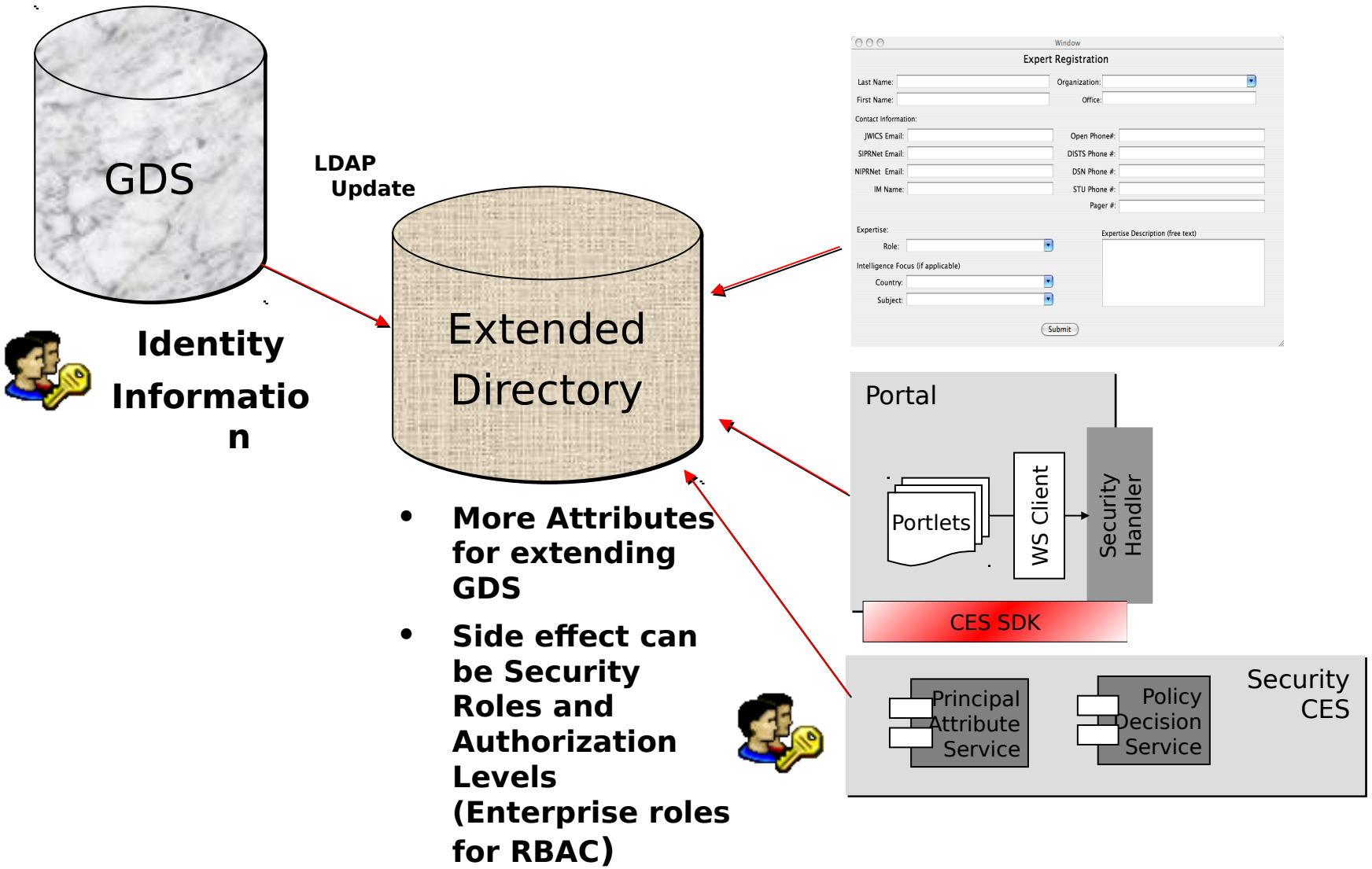
Person Discovery

- **Description:**
  - **Enables searching on selected attributes concerning the full spectrum of the DoD personnel to include civilian, contractor, active duty, reserve etc.**
  - **Plan is to extend Lightweight Directory Access Protocol (LDAP) server to support person attributes currently not within Global Directory Service (GDS) LDAP**
- **Schedule:**
  - **15 Mar 2004: Expert registration API finalized**

Person Discovery: Architecture



- **More Attributes for extending GDS**
- **Side effect can be Security Roles and Authorization Levels (Enterprise roles for RBAC)**

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Mediation: Messaging

- **Description:**
  - **Provide Enterprise Message Bus**
    - **Asynchronous Event Notification. For example:**
      - Alerts
      - Track Updates
      - User Notifications
      - Etc.
    - **Provide Message Quality of Service (QoS)**
    - **Guaranteed Delivery**
    - **Distributed**
    - **Federated**
    - **Platform Independent**
    - **Supports Publish & Subscribe, P2P Models**
      - Java Messaging Service (JMS) Model
  - **Web Service/Wire Protocol Based**
- **Schedule:**
  - **20 Feb 2004: Final API**
  - **1 Apr 2004: Messaging Services available to T&E environment**

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Mediation: Messaging API

- **Web Service based**
  - **Trade-off between performance and inter-operability**
  - **New Standard (1/2004): WS-Eventing**
  - **Other Standards: WS-Transactions, WS-ReliableMessaging**
- **Security**
  - **Provided by Security Solutions**
  - **WS-Security, SAML, etc**
- **Required Operations**
  - **Publish – send one or more messages to a destination**
  - **Subscribe – subscribe for receipt of messages from a destination**
  - **Receive – synchronously receive messages**
  - **Renew – renew the subscription with the provider**
  - **Unsubscribe – remove persistent subscription**
  - **CreateTemp – create a temporary destination for request/reply protocols (almost administration method)**

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Collaboration

- **Description:**
  - **Provides multi-user textual chat, presence awareness, instant messaging, white-boarding, audio and video chat**
  - **Chat/Instant Messaging will follow XMPP open source standard**
    - **Investigating IRC bridge**
  - **Integration with Expert Search**
    - **Presence awareness integrated into expert search**

- **Schedule**
  - **5 Mar 2004:**
    - **Draft Collaboration Specification**
  - **29 Mar 2004:**
    - **Final Collaboration Specification**
    - **Initial Collaboration capability available**
    - **How-to guide for implementation**
  - **30 Apr 2004:**
    - **Collaboration Services refinement available**

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Collaboration: Standards

- **Chat/Instant Messaging, Presence Awareness**
  - **XMPP (eXtensible Messaging and Presence Protocol)**
    - **open source standard**
    - **Adopted as standard protocol by IETF**

- **Application Sharing/Whiteboarding**
  - **T.120 family of standards for Collaboration capability**
    - **T.126 Whiteboarding**
    - **T.128 Application Sharing**
  - **Audio/Video collaboration**
    - **H.323 current standard, but concerns regarding bandwidth abound**
    - **Video Standards (MPEG, AVI, streaming JPEG, NITF)**
    - **Audio Standards (MP3, WMA)**

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C2 Visualization

- **Description:**
  - **Provide portal-based geographical mapping services**
    - **Mil STD 2525 symbology for track visualization**
    - **DII COE/GCCS integration for track correlation**

- **Plan:**
  - **Web-based COP visualization**
    - **Open source WebCOP / eXtensible Information System**
  - **eXtensible Tactical C4I Framework (XTCF) is track mediation extraction layer to mapping agency**

- **Schedule:**
  - **8 Mar 04: C2 Visualization available in the T&E Environment**
  - **22 Mar 04: Publish developer guidance**
  - **Mid-April: Integration of XTCF and C2 Visualization available in T&E Environment (begin integration of other sources)**

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Open Standards for Visualization

- **Open GIS Consortium's (OGC) Web Map Server (WMS)**
- **OGC Web Feature Server (WFS)**
- **OGC Geography Markup Language (GML)**
- **XML and XML Schema**

Metadata Discovery

- **Description:**
  - **Provides the ability to register and discover metadata artifacts (e.g. XML Schemas and Stylesheets) into the DoD Metadata Registry and Clearinghouse**
    - **Web-based user interface to register and discover metadata products**
    - **Provides REST-based API to access metadata products from applications**
  - **SOAP based API provided in 4.0 release**
- **Schedule:**
  - **13 Feb 2004: 4.0 Release installed on NIPRNet**
  - **11 Mar 2004: SIPRNet availability**
    - **Hardware installation/configuration in progress**

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Metadata Mediation

- **Description:**
  - **Offer an initial WS-I based XML translation service**
    - **Provides engine to perform XML translations**
      - Performs translation from one XML schema to a target schema
    - **Using metadata registry XSL products**
    - **One of several components to be offered as NCES mediation capability**
  - **Functional Capabilities**
    - **Allows applications to get information in format/content that the war fighter expects**
      - Data and document translation

- **Schedule:**
  - **28 Feb 2004: XML Translation Service API specification**
    - **V0.2 API specification available**
  - **01 Apr 2004: Initial service development completed**
    - **Web service based XSL Translation Service**

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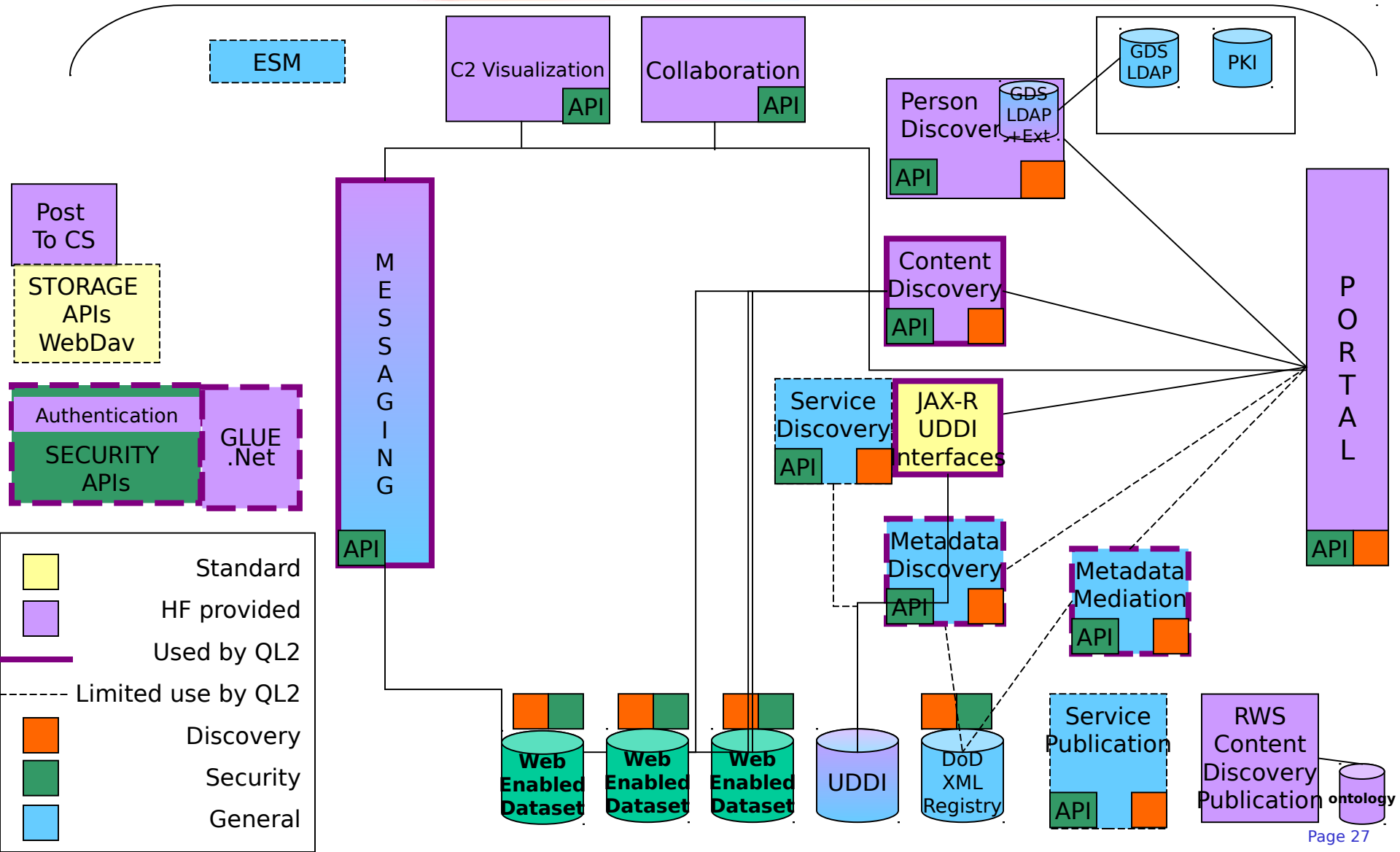
Storage

- **Description:**
  - **Provides a highly connected, highly available persistent community-accessible storage media; focuses especially on the needs of forward edge data providers who may be infrequently connected and using disadvantaged comms**
  - **Horizontal Fusion updating Post to Collateral Space capability to support the WebDAV OASIS standard**
  - **WebDAV Information**
    - **http://www.webdav.org/specs/**
    - **RFC 2518: HTTP Extensions for Distributed Authoring (WebDAV)**
    - **RFC 3253: Versioning Extensions to WebDAV**
  - **HF is NOT providing data warehouse capabilities**

Overall Enterprise Architecture



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Additional Info

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